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DRAWINGS ATTACHED

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COMPLETE SPECIFICATION

Improvements in or relating to Infusion Bags

- I, GUY JOHN OLOF WELIN-BERGER a Subject of the King of Sweden, of 4, Parkgränd, Nacka, Sweden, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—
- Originally, tea has been brewed by placing tea leaves in a tea pot and pouring boiled water into the pot. One has been of the opinion that the water should not be heated more than to the seething temperature, that is, just near the boiling point, since upon boiling point during a long time oxygen is emitted to a higher degree which has been considered disadvantageous to the brewing of tea. During the course of years different packages have been tried containing a portion just large enough to be used for brewing a cup of tea. The tea has been brewed directly in the tea cup in which a bag containing a certain quantity of tea leaves has been immersed or upon which water has been poured. For a long time such portion bags have consisted of a fibre-paper of special, fine quality which has permitted extraction of substances contained in the tea leaves without the leaves being able to permeate. Two different methods have been used for producing the bag. One method consists in that the paper is provided with a very thin film of a heat-sealing material which rendered possible adhesion to another paper along suitable sealing joints which enclose a cavity into which tea leaves have been placed. The other method generally comprises folding of the paper such as to provide a tube into which the tea is placed whereupon this tube is folded at either end and sealed by an adhesion operation or the like. The first named method has more and more been out-distanced by the later one due to the fact that the heat-sealing paper used in the first named method has been considered resulting in a slight flavour. However, in all of the bags hitherto used the extraction has been poor in connection with the tea qualities which have been considered most suitable for making a high-quality tea. The quality of the tea is dependent partly upon where the tea comes from and partly upon to what extent the tea leaves are crushed or ground. In this connection it has been found that the tea particle size of more than 1,7 mm or a so-called "Broken origin Pekoe" tea results in the best relative degree of quality of tea.
- In the use of portion bags of paper it has proved that the extraction through the bags is very poor if the tea leaves have the relatively great particle size which is common in "BOP"-tea. For this reason, such coarse-grained kinds of tea have been blended with so-called dust which normally is a second-rate product obtained in the sieving operation of normal tea and which previously always has been considered a waste product or has been the raw material for so-called brick tea. This tea consisted of a compressed cake of tea dust and has been sold to countries which wanted a very cheap tea. In order to increase the extraction from the portion bags, such a dust has been originally added resulting in an increased emission of colour. However, the quality of the tea has not been improved, since the dust to a high extent has lost aroma and flavour upon fine grinding and later handling performed. However, it has been found recently that a relatively good quality is obtainable and that above all the taste and emission of colouring matter can be improved by grinding coarse leaf tea to a size between 0,6 and 1,7 mm (0,02 and 0,07 inch). Tea of such particle size is called Fannings, and is primarily produced especially for portioned bags. The particle size of the dust is below 0,6 mm, because of the further grinding operation performed in the

production of Fannings aroma losses occur resulting in a reduction of the quality of tea.

For brewing coffee it is known in the art to use close meshed bags of fabric made of threads of artificial silk or plastics threads, such as threads made from regenerated cellulose and nylon, respectively. However, extraction in making a tea beverage takes place in a fundamentally different manner as compared with the brewing of coffee for which reason experience gained from the brewing of coffee cannot quite simply be applied to the brewing of tea. Scientific researches on which the present invention is based have proved that the swiftness of extraction of substances contained in tea leaves is dependent upon the thickness of the threads in the fabric or network of which the bag containing the tea leaves consists and also upon the mesh-size of the fabric or network. As a matter of fact the researches have shown the astonishing result that even relatively course leaf tea of good quality, such as "BOP"-tea, contained in bags with sufficiently pervious walls permits extraction of substances comprised in the tea at an even higher rate than if the tea leaves are lying loose in the water without a bag.

In order to make the walls of the bag sufficiently permeable it has proved advantageous to make the material of the bag from a fabric or network of threads having even or smooth thread surfaces and a comparatively great mesh-size, such as 1 to 6 meshes to 1 mm (approximately 25 to 152 meshes to 1 linear inch) and preferably having a mesh-width of about 0,3 mm (approximately 0,01"). For bags of fabric or network the thickness of the thread should be less than about 0,1mm, preferably about 0,05 mm (0,002"). The percentage of holes of a bag having three meshes to 1 mm (76 meshes to 1 inch) is 70,7% and of a bag having 6 meshes to 1 mm (152 meshes to 1 inch) about 58,5%. If the closeness of the meshes exceeds 5 to 6 meshes to 1 mm (125 to 152 meshes to 1 inch), the extraction is reduced because of the increased closeness of the material. If the closeness of the meshes is less than the value indicated there arises the problem of small particles inevitably carried along with the tea in spite of the sieving operation passing outwards through the walls of the bag and making an unfavourable impression of the bag.

Photometric researches based on measurements of the extraction by observation of the wavelength of the extracted substances have proved that at least in case of comparatively course-leaf tea the extraction in case of bags with opening edges formed by threads having a smooth surface (woven or net fabric bags) has a maximum value at a hole percentage of the walls of the bag amounting

to 70 to 80%. In case of a so-called BOP-tea the maximum value occurs at about 80%, but it may be practical to select a slightly lower hole percentage to avoid waste through the openings or meshes.

The plastics material may advantageously consist of a thermoplastic, since plastics renders possible the provision of smooth opening edges and since thermoplastic permits closing of the bag by heat-sealing. A suitable plastic is nylon or a similar polycondensate or a polymer, such as polypropylene.

Extraction from the bag can be accelerated if the contents of the bag are distributed such that a surface as great as possible becomes accessible to the surrounding liquid. It will be appreciated that the contents of the bag, particularly if the bag contains fine particles, is likely to get agglomerated in the bag upon immersion in the water, thereby impairing the extraction. In order to eliminate this inconvenience, the bag may be subdivided into two or more separate compartments among which the contents of the bag are distributed, and the walls of the bag should be arranged such as to be freely accessible to the surrounding liquid from which the beverage is to be made.

According to the invention, there is provided a bag consisting of woven or net fabric for making a beverage from tea leaves contained in the bag by immersing the bag in water or by infusion, characterized in that the woven fabric or net has a mesh size of 1 to 6 meshes to 1 mm and that the thread of which the bag consists has a smooth surface and a thickness less than 0,1 mm and preferably 0,05 mm, whereby to extract substances comprised in the tea material as quickly as possible.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings, in which;

Fig. 1 shows a bag which has been taken out of the package and Fig. 2 shows the same bag before immersion thereof in a cup or pot. Figs. 3, 4 and 5 illustrate a bag having two compartments and viewed in lateral elevation and collapsed condition in a wrapping, taken out of the wrapping but still in collapsed position, and extended in the condition in which it is to be immersed in a cup or pot, respectively. Figs. 6 and 7 illustrate a bag having a greater number of compartments and seen from one side and from above, respectively. Fig. 8 is a top view of a bag inserted in a heat-sealed wrapping.

Referring to Figs. 1 and 2, numeral 1 denotes a bag consisting of a fabric of threads, and provided at one edge with a flap 2, which is connected to the edge of the bag by means of a narrow part 3, adapted readily to be torn off. The flap 2 is double-walled

end encloses between its walls a coiled string 4, one end 5 of which is connected to the flap and the other end 6 is connected to the bag itself. The flap 2 is adapted to be torn off at the connecting part 3 prior to the immersion of the bag in the cup such that the string upon separation of the flap can be extended to form a remaining connection between the flap and the bag and to facilitate the suspension of the bag in the cup. It is conceivable to have string even prior to the separation of the flap form the only connection between the flap and the bag in which case the connecting part 3 may be omitted.

The fabric or network constituting the plastic material may have a mesh-size of about 0,3 mm and a thread thickness of less than 0,1 mm, preferably about 0.05 mm.

In the embodiment shown in Figs. 3 to 5 the bag is sub-divided into two compartments 1a and 1b each of which has walls of fabric or network interconnected at one edge where a flap 2 with a string according to Fig. 1 may be provided. When enclosed in a wrapping 7 which may be in the form of an envelope the flap 2 is located between the compartments 1a and 1b and has a projecting edge so as to be easily gripped through the opening 8 of the wrapping. The contents of the bag may be distributed among more than 2 compartments. The bag 9 shown in Figs. 6 and 7, is divided into no less than eight compartments which are separated from each other due to the opposite walls of the bag being heat-sealed together along the lines 10 and 11. Preferably centrally of the bag, a string 4 or flap 2 may be provided in a manner similar to the embodiment according to Figs. 1 and 2.

The bag may consist of two plane rectangular pieces of plastics fabric interconnected along the edges by a heat-sealing operation. The bag may be enclosed in packed condition in a wrapping which is similarly

heat-sealed, as shown in Fig. 8. The flap 2 may be a part of this wrapping.

The invention is not limited to the embodiments of the bag illustrated in the drawing.

WHAT I CLAIM IS:—

1. A bag consisting of woven or net fabric for making a beverage from tea leaves contained in the bag by immersing the bag in water or by infusion, characterized in that the woven fabric or network has a mesh size of 1 to 6 meshes to 1 mm and that the thread of which the bag consists has a smooth surface and a thickness less than 0,1 mm and preferably 0,05 mm, whereby to extract substances comprised in the tea material as quickly as possible.

2. A bag according to claim 1, characterized in that the fabric or network consists of a filament of plastics, such as nylon or a similar polycondensate or a polymer, for instance polypropylene.

3. A bag according to claim 1 or 2, characterized in that it is sub-divided into two or more separate compartments amongst which the contents of the bag are distributed and that a string for facilitating the handling the bag has one of its ends secured to a transition line between the compartments, preferably centrally of the bag.

4. A bag according to any of the preceding claims, characterized in that the edges of the walls of the bag are at least partly interconnected by heat-sealing.

5. A tea bag substantially as described with reference to Figs. 1 and 2 or Figs. 3 to 5 or Figs. 6 and 7 or Fig. 8 of the accompanying drawing.

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